

# Endovascular Treatment TASC II C and D aorto-iliac lesion

Authors: Papoyan S.<sup>1</sup>, Mitichkin A.<sup>1</sup>, Shchegolev A.<sup>2</sup>, Semetsov D.<sup>1</sup>, Kvitsaridze B.<sup>1</sup>, Krasnikov A.<sup>1</sup>, Mutaev M.,<sup>2</sup>

<sup>1</sup> Inozemtsev municipal hospital, Moscow, Russia

<sup>2</sup> Pirogov Russian National Research Medical University (RNRMU), Moscow, Russia

Corresponding author: Papoyan Simon Department of vascular surgery, Inozemtsev Moscow Municipal hospital, 1 Fortunatovskaya street Moscow, Russia. Tel. +74993693771 e-mail: 2209792@gmail.com

**Objective:** The paper presents the experience and shown the effectiveness of endovascular interventions in patients with occlusive lesions of terminal aorta and the iliac arteries (types C and D according to the classification of TASC II).

## Introduction

Although open surgery is the preferred approach for treatment of type D lesions according to the TASC II guideline [1], endovascular solutions also appear to be a valid option in selected patients, with similar success rate but less mortality and complications.

## Materials and Methods

This is a prospective study of 45 patients with symptomatic chronic atherosclerotic lower limb ischemia with Chronic total occlusion (CTO) iliac disease. This study was carried out at department of vascular surgery in Inozemtsev Moscow Municipal Hospital during the period from July 2013 to October 2015. The population consisted of 38 male and 7 female patients. Average age 60 years old.

Limb ischemia symptoms were stratified into disabling claudication (64,6%), rest pain (21,2%), and tissue loss (gangrene or ulceration) (21,2%). Before surgery the mean value of ABI was 0.4. According to the TASC-II classification, 17 had TASC type C, and 28 patients had TASC D.

## Technique

The lesion was then approached through an ipsilateral retrograde approach or through a contra lateral crossover technique. The brachial approach was reserved for patients with bilateral iliac lesions. Heparin was administered routinely after placement of a working sheath (5000 UNIT). In all cases, hydrophilic stiff 0.035-inch Glidewire (Terumo Interventional systems, USA) was used in combination with an angled or straight catheter such Glidecath for negotiation of the lesion (Figure 1).

The catheter was used to engage and direct the wire toward the lesion. Balloon angioplasty was performed in all cases for predilatation (Figure 2). The balloon diameter ranged between 5 and 7 mm and balloon length ranged between 60 and 100 mm. Inflation pressure ranged between 8 and 12 atm and inflation time ranged between 30 and 60 s. Routine stenting was performed in all patients. We use and self-expandable or balloon-expandable stents; stent size ranged between 7 and 10 mm and length between 60 and 150 mm. All patients were discharged on and 75 mg clopidogrel daily for 3 months and 100 mg aspirin for long time.

## Follow-up

Clinical follow-up was performed at 1, 6, and 12 months by evaluation of symptoms such as pain improvement or recurrence, progress of ulcer healing, appearance of a line of demarcation of gangrenous tissues, and assessment of both lower limb pulsations; also, aortoiliac duplex ultrasound studies were carried out for five patients as clinical evaluation alone was not sufficient.

## Results

The ipsilateral retrograde femoral approach was used in 26 cases (Figure 1), bilateral retrograde femoral approach was used in 16 patients (Fig. 2), whereas the contralateral femoral approach alone was used in 3 patients; whereas the combined brachial and femoral approach was used in 1 patient (Fig.3). Balloon angioplasty was performed in all cases for predilatation. The balloon diameter ranged between 5 and 7 mm and balloon length ranged between 60 and 100 mm. Inflation pressure ranged between 8 and 12 atm. Inflation time ranged between 30 and 60 s. Routine stenting was performed in all patients. Kissing stents (Fig. 7) were applied in 7 cases: because of flush unilateral CIA occlusion in 5 cases by bilateral femoral approach) and because of occlusion of terminal aorta in two cases (two cases were managed by a combined brachial and retrograde femoral approach). Unilateral stenting was performed in the remaining 38

cases (Figure 8).

Technical success (<30% stenosis on completion angiography) was 100% in TASC C and 92% in TASC D was confirmed by clinical assessment of distal pulsations.

Two patients with lesions of type D, initially failed to recanalizing occluded areas (in the first case - the terminal aorta with bilateral occlusion of the iliac arteries, the second unilateral occlusion of the iliac arteries). Bypass surgery was performed in these cases. An ischemia symptom was regressed in all patients. The mean ABI increased from 0.45 to 0.83 after successful treatment.

## Morbidity

One patient developed brachial thrombosis after sheath removal, which was managed, and three patients developed groin hematoma that was managed conservatively. In 1 case was observed extravasation of contrast in the region of the external iliac artery, without changes in hemodynamics of the patient, successfully eliminated by additional stent implanting, in the second case we observed embolism in the contralateral iliac artery, was successfully resolved by open surgery.



Figure 1 Ipsilateral retrograde femoral approach

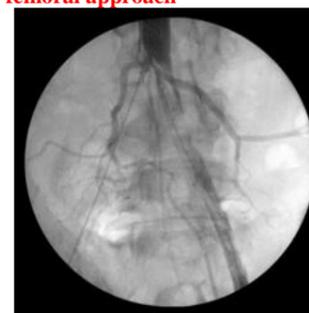


Figure 2 Bilateral retrograde femoral approach

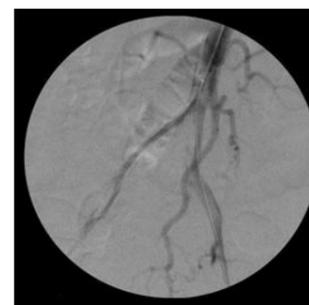


Figure 3 Combined brachial and femoral approach

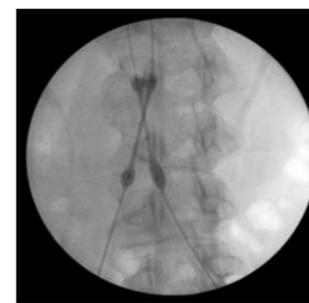


Figure 4 Kissing stenting

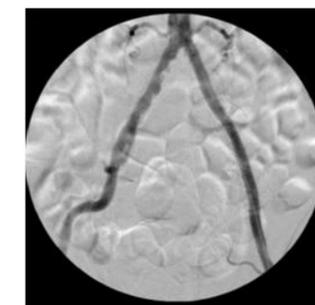


Figure 5 Unilateral stenting

There was no mortality related to the intervention.

**Patency rate** One year follow-up was obtained in 31 patients, the patency of the iliac arteries was 93,3%. After 6 months 1 patient developed with in-stent stenosis of the iliac artery, treated with additional stent implanting.

## Conclusion

Endovascular treatment for iliac artery occlusive disease can be considered an alternative to open surgery for TASC-II C, D (CTO) disease, especially in surgically unfit patients or those who refuse surgical intervention, and kissing stenting is a safe procedure. This approach is particularly beneficial for older patients with limited life expectancy and associated multiple comorbidities (diabetes, hypertension, and cardiac disorders) owing to the less invasive nature of the endovascular procedure and its high patency rate compared with surgery, and for patients with critical limb ischemia (in particular arterial insufficiency ulcers) to prevent infection complications.

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